C2

decreases from the quantum well to the electron storage layer so as to further a flow of electrons from the second energy level to the electron storage layer.

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-24 are pending in the present application. Claims 1 and 13 have been amended by the present amendment.

In the Office Action of February 21, 2003, Claims 4, 5, 7-10, 16, 17 and 19-22 were withdrawn from further consideration; Claims 1, 2, 3, 11, 13-15 and 23 were rejected under 35 U.S.C. § 103(a) as unpatentable over Rosencher et al. in view of Katoh; and Claims 6, 12, 18 and 24 were rejected under 35 U.S.C. § 103(a) as unpatentable over Rosencher et al. and Katoh in view of Nanbu.

The present amendment filed concurrently with a Request for Continued Examination amends independent Claims 1 and 13 to recite the term "at least ten times" instead of the term "one order of magnitude." The claim amendments find support in the specification at least at page 9, lines 32-36, because in a non-limiting example presented on that page a transfer barrier layer has a thickness of 500Å and a quantum well has a thickness of 30Å. Therefore, a thickness of the transfer barrier layer is at least ten times greater than a thickness of the quantum well. It is believed no new matter has been added.

Claims 1, 2, 3, 11, 13-15 and 23 were rejected under 35 U.S.C. § 103(a) as unpatentable over Rosencher et al. in view of Katoh. This rejection is respectfully traversed.

As noted above, amended Claims 1 and 13 recite that a thickness of a transfer barrier layer is at least ten times greater than a thickness of a quantum well.

As discussed in the last two Requests for Reconsideration, none of the applied art teaches or suggests a thickness of a transfer barrier layer is at least one order of magnitude greater than a thickness of a quantum well. Thus, none of the applied art teaches or suggests a thickness of a barrier layer being at least ten times greater than a thickness of a quantum well. Further, as recognized in the outstanding Office Action of February 20, 2002, Rosencher et al. show in Figure 4 a quantum well having a thickness of 80Å and a transfer barrier of 200Å. Therefore, Rosencher et al. do not teach or suggest a thickness of the transfer barrier layer is at least ten times greater than a thickness of the quantum well.

Further, Katoh also does not teach or suggest the claimed features.

Accordingly, it is respectfully submitted independent Claims 1 and 13 and each of the claims depending therefrom patentably distinguish over the applied art.

Claims 6, 12, 18 and 24 were rejected under 35 U.S.C. § 103(a) as unpatentable over Rosencher et al. and Katoh in view of Nanbu. This rejection is respectfully traversed.

Claims 6, 12, 18 and 24 depend either directly or indirectly on independent Claims 1 and 13, which as discussed above are believed to be allowable. Further, Nanbu also does not teach or suggest the claimed features. Therefore, it is respectfully requested this rejection be withdrawn.

In addition, regarding the withdrawal of Claims 4, 5, 7-10, 16, 17 and 19-22, it is noted these claims depend on independent Claims 1 and 13, and accordingly, should also be allowable.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Gregory J. Maier
Attorney of Record
Registration No. 25,599
David A. Bilodeau
Registration No. 42,325

22850

Tel: (703) 413-3000
Fax: (703) 413-2220
GJM/DAB/RFF/ys
I:\atty\Rff\0s\0154\01542811\01542811-ame-rce.wpd

Marked-Up Copy
Serial No: 09/328,391
Amendment Filed on:

June 23, 2003

IN THE CLAIMS

Please amend Claims 1 and 13 as follows:

--1. (Three Times Amended) An electromagnetic wave detector comprising:

a stack of layers made of III-V semiconductor materials, a conduction band profile of said materials defining at least one quantum well, said quantum well having at least one first discrete energy level populated with electrons that are capable of passing to a second energy level under an absorption of an electromagnetic wave; and

means for counting said electrons in the second energy level,

wherein the stack of layers of semiconductor materials furthermore comprises a transfer barrier layer, and an electron storage layer separated from the quantum well by the transfer barrier layer, and

wherein a thickness of the transfer barrier layer is at least [one order of magnitude] ten times greater than a thickness of the quantum well, a lowest energy level of a conduction band of the transfer barrier layer is greater than energy levels of the quantum well and the electron storage layer, and the conduction band profile of the stack of layers of semiconductor materials decreases from the quantum well to the electron storage layer so as to further a flow of electrons from the second energy level to the electron storage layer.

13. (Twice Amended) An electromagnetic wave detector comprising:

a stack of layers made of III-V semiconductor materials, a conduction band profile of said materials defining at least one quantum well, said quantum well having at least one first discrete energy level populated with electrons that are capable of passing to a second energy level under an absorption of an electromagnetic wave; and

a counting unit configured to count said electrons in the second energy level,

wherein the stack of layers of semiconductor materials furthermore comprises a transfer barrier layer, and an electron storage layer separated from the quantum well by the transfer barrier layer, and

wherein a thickness of the transfer barrier layer is at least [one order of magnitude] <u>ten times</u> greater than a thickness of the quantum well, a lowest energy level of a conduction band of the transfer barrier layer is greater than energy levels of the quantum well and the electron storage layer, and the conduction band profile of the stack of layers of semiconductor materials decreases from the quantum well to the electron storage layer so as to further a flow of electrons from the second energy level to the electron storage layer.--